UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/594,577	06/15/2000	Hideaki Hosokawa	000683	8983

23850 7590 07/02/2003

ARMSTRONG,WESTERMAN & HATTORI, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER	
NICKOL, GARY B	

ART UNIT	PAPER NUMBER
1642	19

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/594,577	HOSOKAWA ET AL.	
	Examiner	Art Unit	
	Gary B. Nickol Ph.D.	1642	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *31-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Response to Amendment

The Amendment filed August 12, 2002 (Paper No. 8) in response to the Office Action of May 21, 2002 is acknowledged and has been entered.

Claims 1-30 were cancelled.

Claims 31-44 were added and are currently under consideration.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

New Rejections:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 31-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 31-44 are rejected as vague for referring to proteins that selectively bind to a sugar chain structure. Where are the different sugar chain structures located? Are they part of

CEA? If so, this rejection can be obviated by amending the claims to indicate that the proteins selectively bind to a (first, second, third, or fourth) sugar chain structure on CEA.

Claims 31-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The newly added claims do not appear to have support in the specification for the following reasons:

1) Claims 31-33 include specific steps which are not described in the original disclosure. For example, Claim 31 includes adding to a "first portion" of a sample to be assayed a first protein and an antibody. Next, in part ii- the claims include adding to a "second portion" of said sample to be assayed a second protein. Claims 32 and 33 follow the latter two steps by adding to a "third portion" and adding to a "fourth portion". Essentially, there is no support in the disclosure for the partitioning of a sample into first, second, third and fourth portions.

2) The claims, as written, do not find support for the specific types of antibodies that may be used. For example, Claim 38 recites a method of detecting colon cancer including a detectable amount of a complex of CEAs with the anti-Le^a antibody (See table I). However, the detectable ratio or percentage of antibodies used for the detection of colon cancer indicates that the anti-Le^y antibody was detected.

3) The claims also do not have support for merely detecting cancer by using a certain quantity of proteins that bind to certain sugar chain structures. For example, Claim 31 employs at least two proteins that recognize different sugar chain structures- presumably on CEA. The support for this appears to be derived from Table 1 in a qualitative manner. This is followed up in Claims 32 and 33 where third and forth proteins are added to the sample, which, collectively, recognize different sugar chain structures...presumably on CEA. However, the ability to detect a *particular* type of cancer from a sample is much more quantitative. It is based on the ratio of the amount of the CEAs having a specific sugar chain structure relative to the total amount of CEAs in the sample compared to normal human being samples wherein said anti-sugar proteins require the addition of all four antibodies to S-Le^a, S-Le^x, Le^a and Le^y (Table I), not merely two or three proteins in some instances. Furthermore, in some instances, only ONE antibody need be detected (i.e, for the detection of metastasis of bone marrow to the lymph, liver cancer and colon cancer)- yet some of the claims (Claims 38, 40, 43) to specific cancers all ultimately depend from Claim 31 which requires that two different sugar chain antibodies be added to first and second portions.

In short, the newly added claim language does not find support from the disclosure. It is further noted that with the submission of the new claims, applicants did not point where in the specification support could be found. With respect to newly added or amended claims, applicant should show support in the original disclosure for the new or amended claims. See MPEP §714.02 and § 2163.06.

Claims 31-35 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method for detecting cancer comprising:

1. Adding to a sample an antibody to a constant region of CEA

2. Adding to said sample a first protein which selectively binds to a sugar chain structure on CEA, said first protein is selected from the group consisting of Anti-Le^a antibody, Anti-S-Le^x antibody, Anti-S-Le^a antibody and Anti-S-Le^y antibody,

3. Adding to said sample, a second protein which selectively binds to a second sugar chain structure on CEA different from said first protein wherein said second protein is selected from the group consisting of Anti-Le^a antibody, Anti-S-Le^x antibody, Anti-S-Le^a antibody and Anti-S-Le^y antibody.

4. Adding to said sample, a third protein which selectively binds to a third sugar chain structure on CEA wherein said third protein is different from said first and second protein and wherein said third protein is selected from the group consisting of Anti-Le^a antibody, Anti-S-Le^x antibody, Anti-S-Le^a antibody and Anti-S-Le^y antibody.

5. Adding to said sample, a fourth protein which selectively binds to a fourth sugar chain structure on CEA wherein said fourth protein is different from said first, second, and third protein, and wherein said fourth protein is selected from the group consisting of Anti-Le^a antibody, Anti-S-Le^x antibody, Anti-S-Le^a antibody and Anti-S-Le^y antibody.

6. Determining the presence of a cancer in said sample based on a ratio of the amount of the CEAs having a specific sugar chain structure relative to the total amount of CEAs in the sample compared to normal human being samples.

does not reasonably provide enablement for the method as broadly claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

The claims are broadly drawn to a method of detecting cancer comprising adding to partitioned samples; first, second, third, and fourth proteins which selectively bind to different sugar chain structures further including an antibody to a constant region of CEA.

The specification teaches (page 7, last paragraph) that the specific sugar chain binding protein includes, for example, an antibody and a lectin. The specification goes on to list (pages 7-8) the wide variety of both antibodies or lectins that may be included which selectively bind to different sugar chain residues. However, the specification teaches (page 21), that with regards to detecting cancer, one must employ the "proper combination" of the total amount of CEAs, and an amount of the CEAs having a "specific" modified sugar chain structure, and an amount of the CEAs having a sugar chain structure "other than the specific one". Moreover, the specification teaches that particular types of cancer can be determined by conducting the measurement with the use of "plural" kinds of *specific* sugar chain binding proteins and analyzing the results. The specification further teaches (page 25), with regards to the detection of cancer, antibodies against any one of S-Le^a, S-Le^x, Le^a and Le^y were added to a reaction sample containing a standard amount of antibody-labeled CEA. The specification further teaches (Table 1) that a ratio was determined which compared the amount of the CEAs reacted to a *specific* anti-sugar chain antibody relative to the amount of total CEAs (presumably, the total CEAs being the combination of the standard CEA plus any CEA derived from the human samples). For example, to determine rectal cancer, there must exist a certain percentage of S-Le^a and Le^a compared to total CEAs in the sample.

However, one cannot extrapolate the teachings of the specification to the scope of the claims because the claims are broadly drawn to detecting any type of cancer by employing at

least two proteins that bind to different sugar chain structures on CEA wherein said proteins include any and all proteins in the universe followed by the addition of two more proteins that also bind to different sugar chain structures wherein said proteins may be any and all proteins in the universe including any lectins and any antibodies, and applicant has not enabled all of these types of proteins because it has not been shown that these proteins are capable of functioning as that which is being disclosed. In particular, the specification lacks the necessary guidance for one of skill in the art to predictably detect cancer because it appears that the method is limited to a particular combination of anti-sugar antibodies, not just any lectin or protein. Thus, the method is specific for the selection of a defined protein which recognizes a sugar chain residue on CEA… not any and all sugar chain residues as broadly claimed. It would require undue experimentation for one of skill in the art to simply test the thousands of lectins and proteins which bind to different sugar chain residues in order to detect a particular type of cancer absent the information disclosed in Table I. Furthermore, simply "detecting" if a complex if formed between a first protein which binds to a sugar structure and an antibody to CEA and "detecting" if a complex is formed between a second protein (which binds to a different sugar chain structure than said first protein) and an antibody to CEA in order to determine the presence of a particular cancer based on whether said complexes are detected is beyond the scope of the disclosure. The guidance necessary to detect a particular type of cancer is highly specific to the determined **ratio** of specific anti-sugar chain antibodies relative to the total amount of CEAs. Thus, the scope of the presently claimed subject matter does not appear to encompass methods for detecting cancer because merely detecting complexes of different anti-sugar chain moieties in combination with an antibody to a constant region of CEA is not disclosed.

Further the reasons set forth above, undue experimentation would be required in order to practice the method as broadly claimed.

All other rejections and or objections are withdrawn in view of applicant's amendments and arguments there to.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary B. Nickol Ph.D. whose telephone number is 703-305-7143. The examiner can normally be reached on M-F, 8:30-5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Caputa can be reached on 703-308-3995. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-308-4242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Gary B. Nickol Ph.D.
Examiner
Art Unit 1642

GBN
June 25, 2003

ANTHONY C. CAPUTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600